



## **H.R. 2272 – The 21st Century Competitiveness Act of 2007**

### **Floor Situation**

H.R. 2272 is being considered on the floor under suspending of the rules and will require a two-thirds majority vote for passage. This legislation was introduced by Representative Bart Gordon (D-TN) on May 10, 2007. The bill was referred to the Committee on Science and Technology, but was not considered.

H.R. 2272 is expected to be considered on the floor on May 21, 2007.

### **Background**

H.R. 2272 is an amalgamation of 4 bills that have previously passed the House of Representatives during the 110<sup>th</sup> Congress and 1 bill that passed during the 109<sup>th</sup> Congress. The 5 bills that compose H.R. 2272 are:

- 1) 10,000 Teachers, 10 Million Minds Science and Math Scholarship Act (H.R. 362). H.R. 362 passed the House of Representatives by a recorded vote of 389 - 22 ([Roll no. 254](#)). The Senate has received the bill, but no action has been taken. For more information, please see the [Legislative Digest for H.R. 362](#).
- 2) Sowing the Seeds Through Science and Engineering Research Act (H.R. 363). H.R. 363 passed the House of Representatives by a recorded vote of 397 - 20 ([Roll no. 257](#)). The Senate has received the bill, but no action has been taken. For more information, please see the [Legislative Digest for H.R. 363](#).
- 3) National Science Foundation Authorization Act of 2007 (H.R. 1867). H.R. 1867 passed the House of Representatives by a recorded vote of 399 - 17 ([Roll no. 295](#)). The Senate has received the bill, but no action has been taken. For more information, please see the [Legislative Digest for H.R. 1867](#).
- 4) Technology Innovation and Manufacturing Stimulation Act of 2007 (H.R. 1868); H.R. 1868 passed the House of Representatives by a recorded vote of 385 - 23 ([Roll no. 301](#)). The Senate has received the bill, but no action has been taken. For more information, please see the [Legislative Digest for H.R. 1868](#).

- 5) A bill to amend the High-Performance Computing Act of 1991. In the 109<sup>th</sup> Congress, Representative Judy Biggert (R-IL) introduced H.R. 28, which passed the House of Representatives by voice vote on April 26, 2005. The Senate received this bill, but took no action. The text of H.R. 28 was introduced by Representative Brian Baird (D-WA) in the 110<sup>th</sup> Congress, and Rep. Biggert is an original cosponsor.

## **Summary**

### **Title I – Text of the 10,000 Teachers, 10 Million Minds Science and Math Scholarship Act**

This section increases the quantity and quality of math and science teachers in America. The legislation increases the number and amount of grants available to teachers and students who pursue continued education in the fields of science and engineering.

The legislation also increases grants within the Robert Noyce Scholarship Program, which is a program administered by the National Science Foundation (NSF). The scholarship program provides financial aid to students in return for their commitment to teach for 2 years after college for each year the scholarship is awarded. This bill increases the grants received from the program to \$10,000 from \$7,500.

H.R. 2272 establishes a national review board to examine the teaching materials currently in use in elementary, middle, and high schools to see if the material can be improved.

The Director of NSF is required to establish a research pilot program called “Partnerships for Access to Laboratory Science.” This program will award grants to partnerships to enhance math and science programs at secondary schools by improving the lab experience for students, through equipment purchases and upgrades and teacher training and development on the use of lab equipment and lab experiments.

Additional grants are made available for Master’s programs as well as teacher training for teachers in advance placement fields. The grants will be a minimum of \$75,000 with \$2 million being the cap for each fiscal year. They will be administered through the NSF.

The legislation also expands the NSF’s science, technology, engineering and math Talent Expansion Program (STEP). This program offers grants to institutions of higher education to increase the number of undergraduate students that complete programs in science, technology, engineering or math fields. Grant funding may be used to promote research, interdisciplinary teaching, and other activities such as internships, student advising, and community college bridge programs.

*\*Note: This title contains the text of the Republican Motion to Recommit H.R. 362, which was agreed to in the House of Representatives by a recorded vote of 408 - 4 ([Roll no. 253](#)). The Motion to Recommit added language affirming the authority of states and local school boards to determine curricula.*

## Title II – Text of the Sowing the Seeds Through Science and Engineering Research Act

This section encourages research and development in a variety of fields. The legislation allows the National Science Foundation and Department of Energy to issue a series of monetary awards to those engaged in research in their perspective fields.

In order for a recipient to be eligible for an award they must meet the following criteria:

- In a tenure-track position as an assistant professor or equivalent title, or hold an equivalent position, at an institution of higher education in the United States or an organization in the United States that is a nonprofit, nondegree-granting research organization such as a museum, observatory, or research laboratory

If the candidate for the award meets the above criteria, the Director of the National Science Foundation will evaluate the request based on:

- the intellectual merit of the proposed work;
- the innovative or transformative nature of the proposed research;
- the extent to which the proposal integrates research and education, including undergraduate education in science and engineering disciplines; and,
- the potential of the applicant for leadership at the frontiers of knowledge.

The rewards will last for 5 years and will be no less than \$80,000 for each year. The sum may be higher depending on the research being conducted.

The Department of Energy will also develop a program similar to the National Science Foundation. The criterion is the same as above. The Department of Energy will give priority to proposals in which the proposed work includes collaboration with the Department of Energy National Laboratories. The Secretary of Energy will be authorized, based on appropriations, \$25 million dollars to carry out the program.

Within 2 years of the enactment of the bill, a report must be delivered to the House Committee on Science and Technology and the Senate Committee on Commerce, Science, and Transportation on the impact of the overall reward program focusing on the ability of young faculty to compete for National Science Foundation research grants.

This legislation also creates the Presidential Innovation Award and creates a “National Coordination Office for Research Infrastructure” within the Office of Science and Technology.

The Presidential Innovation Award will be given to individuals chosen by the Director of the Office of Science and Technology Policy who have developed unique scientific or engineering ideas in the national interest. These individuals must be United States citizens or in the process

of becoming citizens. The purpose of the award is to give an example to students as to how science and engineering can be used to help further national interests. It is hoped that by giving young people more role models in the fields of science and engineering that they will want to enter those fields, thus increasing America's presence in the perspective fields.

The National Coordination Office for Research Infrastructure will identify and prioritize the deficiencies in research facilities and equipment located at academic institutions and at national laboratories that are available for use by academic researchers and institute and coordinate the planning and acquisition, refurbishment, and maintenance of research facilities and major instrumentation required to address the deficiencies that are discovered.

The office will report back to Congress annually on the progress being made in acquiring equipment and updating facilities.

The legislation also expresses a sense of congress that NASA should be funded at the levels requested in the President's budget and that NASA contributes to the development of young scientists and engineers.

*\*Note: This title contains the text of the Republican Motion to Recommit H.R. 363, which was agreed to in the House of Representatives by a recorded vote of 264 - 154 ([Roll no. 256](#)). The Motion to Recommit gives priority to grants to expand domestic energy use and production through coal-to-liquids and advanced nuclear reprocessing.*

#### Title III – Text of the National Science Foundation Authorization Act of 2007

This section authorizes funds for the National Science Foundation (NSF) for the fiscal years 2008, 2009, and 2010.

##### Authorizations for fiscal year 2008

- The bill authorizes to the NSF \$6.5 billion.

##### Authorizations for fiscal year 2009

- The bill authorizes to NSF \$6,980,000,000.

##### Authorizations for fiscal year 2010

- The bill authorizes to NSF \$7,493,000,000, of which.

##### Award for Major Research Instrumentation

- Allows for awards to be granted for Major Research Instrumentation. These awards shall be between \$100,000 and \$4 million, except if the total amount authorized for the Major Research Instrumentation program is more than \$125 million, then the maximum award may not exceed \$6 million.
- These funds may also be used to support the operations and maintenance of instrumentation and equipment.

#### Undergraduate Education Programs

- Requires that an institution of higher learning receiving funds for the program must provide at least 30% funding from private or non-federal entities. However, the bill waives this clause (or reduces the funding match) if the institution of higher learning:
  - Does not offer a Ph.D. program;
  - Is not ranked in the top 100 of institutions receiving Federal research and development funds;
  - Can prove that the project will make a substantial impact on the institution's research; or,
  - Is a consortia of institutions of higher education that includes at least one non-Ph.D granting institution.

#### Centers for Research on Learning and Education Improvement

- The bill directs the Director of the Foundation (“the Director”) to continue the program of Centers for Research on Learning and Education Improvement (“the Centers”). The Centers conduct and evaluate research in cognitive science, education, and related fields, and develop ways in which the results of such research can be applied in elementary school and secondary school classrooms to improve the teaching of mathematics and science.

*\*Note: This Center was established in Section 11 of the National Science Foundation Authorization Act of 2002.*

#### Interdisciplinary Research

- The National Science Board (“the Board”) must evaluate the Foundation’s role in supporting interdisciplinary research, and its efforts to engage undergraduate students in research experiences in interdisciplinary settings.

- The board must provide results on its findings, including a recommendation for the proportion of the Foundation's research and related activities that should be allocated for interdisciplinary research.

#### Pilot Program of Grants for New Investigators

- The bill creates a pilot program to award grants to those individuals whose proposals were submitted to the Foundation but were denied. The one-year grant aims to assist in improving research proposals.
- These funds must be used by the individual to "support the generation of new data" in order to resubmit a proposal for review by the Foundation.
- To receive this grant an individual must:
  - Not have received funding as a principal investigator from the Foundation; and,
  - Have submitted a proposal to the Foundation that was rated very good or excellent under the Foundation's competitive merit review process but not accepted.

#### Broader Impacts Merit Review Criterion

- Requires the Director to give special consideration to proposals that involve partnerships between academic researchers and industrial scientists and engineers that involve research areas considered to have high importance for future national economic competitiveness.

#### Reporting of Research Results

- The final project reports and published research citations from any federally- funded NSF research must be available to the public in electronic form on the Foundation's website.

#### Sharing Research Results

- If the Director of the Foundation determines that any individual conducting research as part of a Foundation grant that does not comply with Section 734 of the Foundation Grant Policy Manual (accurate authorship, sharing of findings), then that individual may not be eligible for future grants. However, the Director may restore the eligibility of an individual if that individual complies with Section 734.

#### Funding for Successful STEM Education Programs

- The Director may extend grants from 1 year to 3 years for those individuals that meet the primary qualifications of the Science and Engineering Equal Opportunity Act (42 U.S. Code 1885 et seq.) or that have the primary purpose of providing teacher professional development.

### Donations

Allows for donations to be made for specific prize competitions.

### Title IV – Text of the Technology Innovation and Manufacturing Stimulation Act of 2007

This section:

- Authorizes \$2.5 billion in funding for NIST activities for FY2008-FY2010 (Title 1). This includes appropriations for laboratory activities, the Malcolm Baldrige National Quality Award Program, the Manufacturing Extension Partnership, the Technology Innovation Program, and construction and maintenance related to scientific and technical research.

					H.R. 1868		
Program	FY2006 enacted	FY2007 request	FY2007 enacted	FY2008 request	FY2008	FY2009	FY2010
NIST labs	392	459	425	492	471	498	538
Construction	176*	68	59	94	94	86	50
Baldrige**	7	8	8	8	8	8	8
MEP	106	46	106	46	113	122	132
ATP/TIP	80	0	80	0	110	142	151
Total	585	581	678	640	796	856	879

*\*Funding table courtesy of the Science and Technology Committee*

- Establishes a Manufacturing Extension Partnership Advisory Board to (Sec. 203):
  - advise on Manufacturing Extension Partnership programs, plans, and policies;
  - assess the Manufacturing Extension Partnership plans and strategies; and
  - assess current performance against Manufacturing Extension Partnership program plans.
- Creates a grant program within the Manufacturing Extension Partnership to develop projects that solve emerging manufacturing problems and improve long-term economic stability (Sec. 203). *The House passed legislation in the 108<sup>th</sup> (H.R. 255) and 109<sup>th</sup> Congress (H.R. 3598) that included a similar grant program.*
- Establishes the Technology Innovation Program (TIP) to assist U.S. businesses and other organizations in developing high-risk technology with economic benefits for the Nation.

It also creates a TIP Advisory Board to advise and review the program's efforts (Sec. 204).

- Creates a pilot program to partner universities and industry to solve problems in manufacturing technology (Sec. 206). *The House passed legislation in the 108<sup>th</sup> (H.R. 255) and 109<sup>th</sup> Congress (H.R. 3598) that included a similar pilot program.*
- Expands NIST's fellowship program to include more post-doctoral and senior research fellowships (Sec. 207).

#### Title V – Text of the bill to amend the High-Performance Computing Act of 1991

This section makes amendments to the High Performance Computing Act of 1991. The legislation requires the President to implement a National High-Performance Computing Program, which will provide for:

- Long-term basic and applied research on high-performance computing;
- Research and development on, and demonstration of, technologies to advance the capacity and capabilities of high-performance computing and networking systems;
- Sustained access by the research community in the United States to high-performance computing systems that are among the most advanced in the world in terms of performance in solving scientific and engineering problems, including provision for technical support for users of such systems;
- High-performance networks, including experimental testbed networks, to enable research and development on, and demonstration of, advanced applications enabled by such networks;
- Educating and training additional undergraduate and graduate students in software engineering, computer science, computer and network security, applied mathematics, library and information science, and computational science; and,
- Improving the security of computing and networking systems, including Federal systems, including research required to establish security standards and practices for these systems.

This title requires the President to:

- Establish the goals and priorities of Federal high-performance computing research, development, networking, and other activities;



- Establish Program Component Areas that implement the goals established above, and identify the Grand Challenges that the Program should address;
- Provide for interagency coordination of Federal high-performance computing research, development, networking, and other activities undertaken pursuant to the Program.

**Cost**

The Congressional Budget Office has not scored this legislation.

**Staff Contact**

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